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December 1, 1980

Part V

Environmental Protection Agency

Water Pollutants; Withdrawal of Proposal To Add Ammonia to Toxic Pollutant List and Denial of Petition To Add Ammonia and Sulfide to Conventional Pollutant List

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 401

[WH-FRL1642-6]

Toxic Pollutant List; Notice of Withdrawal of Proposal To Add Ammonia

AGENCY: Environmental Protection Agency.

ACTION: Notice of proposal withdrawal.

SUMMARY: Following receipt and evaluation of public comments, the Environmental Protection Agency withdraws its proposal to add ammonia to the toxic pollutants list at this time. While ammonia is acutely and chronically toxic to aquatic life, it is not persisternt in the aquatic environment and poses no human health threat at levels typically found in ambient water as a result of point source discharges.

EFFECTIVE DATE: December 1, 1980.

FOR FURTHER INFORMATION CONTACT: Davie Sabock (202) 245-3042.

SUPPLEMENTARY INFORMATION:

Background

On January 3, 1980 45 FR 803 EPA proposed the addition of ammonia to the toxic pollutants list. This proposal was based on evidence of acute and chronic toxicity to certain aquatic species of point source discharges of the pollutant.

Following analysis of public comments, EPA again evaluated the proposed listing of ammonia as a toxic pollutant. The Agency now withdraws that proposal because: 1. Ammonia in water poses no human health threat at levels typically found in ambient water as a result of point source discharges.

2. Ammonia is biodegradable and does not persist in the aquatic environment.

3. Ammonia is not normally present in ambient waters at concentrations toxic to warmwater fish species.

4. Water Quality Standards and technology-based effluent limitations provide for adequate protection of aquatic organisms from point source ammonia discharges.

5. Listing ammonia as a toxic pollutant would affect only industrial point source discharges, which account for only about 10 percent of the ammonia discharged to waters.

As a "non-toxic, non-conventional" pollutant ammonia remains subject to effluent limitations representing "best available technology economically achievable" ("BATEA"). The regulatory effect of designating ammonia as a toxic pollutant would have been to make economic (301(c)) and water-quality based (301(g)) waivers from BATEA unavailable to industrial dischargers. However, since ammonia poses no human health threat, is not persistent and is highly toxic to only a limited group of sensitive aquatic species, the wholesale elimination of waivers is inappropriate. State water quality standards and environmental assessments under (301(g)) should ensure adequate protection of any biological areas of concern.

Furthermore, EPA has estimated that about 10 percent of ammonia discharged to U.S. waters comes from industrial sources, the remainder coming from POTW's, which would be unaffected by the proposed listing. Other major sources of ammonia in water are precipitation and agricultural runoff. Since industry contributes such a small fraction of the ammonia reaching U.S. waters, even complete elimination of industrial sources would not materially lower that burden. Therefore, even if listing ammonia as a toxic pollutant were justified by its properties, such listing would not lead to more effective treatment.

In making its decision to withdraw the proposal to list ammonia as a toxic pollutant, EPA carefully considered the 219 public comments received. These comments (217 against the proposal, 2 for it) are summarized below as information only. The comments presented below summarize the major views expressed by the public. Inclusion herein does not suggest that the Agency necessarily agrees with the conclusions expressed. Therefore, they are not to be considered as suggesting an Agency position.

1. Most of the ammonia reaching natural waters comes from uncontrollable non-point sources, such as agricultural runoff, decay of organic material and precipitation. Since less than 10 percent is of industrial origin, control of these sources would not result in measurable benefits.

2. EPA's listing of ammonia as a toxic pollutant would result in extremely stringent treatment requirements which would have to be met even in areas where increased ammonia removal would not materially improve the lot of aquatic organisms. Various industrial commenters estimated unnecessary treatment costs for their industries ranging from hundreds of millions to billions of dollars.

3. Section 307(a) was intended by the Congress for use only on chemicals posing a serious threat to human health, aquatic life, or both, which could not be otherwise controlled. Ammonia is a non-persistent substance which poses no human health hazard and is essential to all life. Because of this it does not qualify for addition to the toxic pollutant list.

4. EPA has not presented an evaluation of how well current controls are working or an estimate of improvements to be expected from adding ammonia to the toxic pollutants list.

5. Total ammonia should not be listed as a toxic pollutant because in natural waters only a fraction of total ammonia is in the toxic un-ionized form. Since this fraction varies with water quality and temperature, the parameter of concern should be un-ionized ammonia.

6. Fish have survived in paper mill effluents which far exceed "Red Book" water quality criteria for ammonia. Fish farms with ammonia levels far in excess of criteria have supported growth and development of catfish, *gambusia*, shad, largemouth bass, bluegill and green sunfish for more than a year. This suggests that the criterion, based on laboratory tests with trout, is overprotective when applied to warmwater fishes.

7. Dischargers who have evaluated aquatic biota of receiving waters before and after installation of facilities discharging ammonia have found no differences in these ecosystems that would be attributed to ammonia.

8. Since the costs associated with complying with regulations resulting from listing ammonia as toxic pollutant would exceed $100 million, EPA is required by Executive Order 12044 to perform a "Regulatory Analysis." Since EPA has not done this, the proposal to list ammonia is premature.

9. EPA has not complied with OMB directives requiring cost/benefit analyses. Therefore, the proposal to list ammonia is premature.

10. Data purporting to show synergism with dieldrin are irrelevant because of the strict controls already applied to that pesticide.

11. Ammonia is used in treatment of drinking water and should, therefore, not be listed as a toxic pollutant.

12. Listing ammonia as a toxic pollutant could require publicly owned treatment works (POTW's) to install treatment facilities, even though EPA construction grants for advanced waste treatment (AWT) are available only if the grantee can show that AWT would provide significant improvement in water quality and human health.

13. EPA has not attempted to estimate the number of fish kills which would be prevented by listing ammonia as a toxic pollutant, nor has it shown that fish kills mentioned in the **Federal Register** are

attributable to point source ammonia discharges.

14. Production data are unrelated to how much ammonia enters the waters of the United States and are, therefore, irrelevant.

15. Marine waters are so well suited for absorbing and using ammonia that ammonia poses no problem in such waters.

16. Inclusion of ammonia on the toxic pollutant list would hamper development of the synthetic fuels industry.

17. Some wastewater treatment systems require the addition of ammonia as a nutrient to support microorganisms which remove other pollutants.

18. It is unfair to require industries to remove ammonia to lower levels than other dischargers.

19. It is wasteful to remove ammonia to levels required to protect organisms not native to the area. For instance, warmwater areas will not support trout, but the criterion is established to protect trout. Warmwater fishes tolerate much higher ammonia levels. EPA failed to consider "the usual or potential presence of affected organisms," as required by the CWA.

20. Removing ammonia from wastewaters as a result of listing it as a toxic pollutant might cause increased ammonia pollution in other media.

21. Not all of the six factors required to be considered for placing a substance on the toxic pollutant list indicate that ammonia is hazardous.

22. EPA proposed adding ammonia to the toxic pollutants list for administrative convenience.

Dated: November 24, 1980.

Douglas M. Costle,

Administrator.

[FR Doc. 80-37217 Filed 11-28-80; 8:45 am]

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ENVIRONMENTAL PROTECTION AGENCY

[WH-FRL 1642-6a]

Conventional Pollutant List; Notice Denying the Addition of Ammonia and Sulfide

AGENCY: Environmental Protection Agency.

ACTION: Notice of petition denial.

SUMMARY: Following receipt and evaluation of public comments, the Environmental Protection Agency denies the proposal to add ammonia and sulfide to the conventional pollutants list as petitioned by the American Iron and Steel Institute. While ammonia and sulfide are oxygen demanding, naturally occurring, and biodegradable, they have not traditionally been the primary focus of wastewater control.

Background

Pursuant to section 304(a)(4) of the Clean Water Act (CWA), the Administrator shall, as appropriate and from time to time, publish information identifying conventional pollutants. In a previous action published at 43 FR 32857 (July 28, 1978), the Environmental Protection Agency described pollutant criteria employed to substantiate the listing of a substance as a conventional pollutant. Based on a review of the Clean Water Act and its legislative history, the Agency identified three classes of substances which may comprise conventional pollutants: oxygen demanding substances, solids and nutrients. One group of criteria represents characteristics common to all of these classes: pollutants which are naturally occurring, biodegradable, oxygen demanding materials, and solids which have similar characteristics to naturally occurring biodegradable substances. The second criterion is that the pollutants traditionally have been the primary focus of wastewater control.

The Agency received 39 comments on the petition, comments which both supported and opposed the petition. (A summary of the specific comments received is attached as an Appendix to this notice.) After consideration of the public comments and evaluation of ammonia and sulfide in light of the listing criteria, the Agency has determined to deny the petition.

Discussion:

Evaluation of Ammonia and Sulfide According to the Conventional Pollutants Selection Criteria

The Agency agrees with petitioners that ammonia and sulfide are oxygen-demanding substances, that they are naturally occurring, and that they are biodegradable. The Agency disagrees, however, that either ammonia or sulfide have been the primary focus of wastewater control. The bases for these conclusions are set out below: (a) Oxygen-Demanding Substance: this criterion applies to any substance which throughout the course of its decomposition, whether biological, chemical, or photochemically depletes the dissolved oxygen concentration in water. Ammonia and sulfide both exhibit this characteristic. The oxygen demand of ammonia can be easily realized by way of a stoichiometric relationship involving oxygen and ammonia nitrogen conversion to nitrate. This biological conversion demonstrates a theoretical ratio of about 4.6 molecules of oxygen to 1 molecule of ammonia. Sulfides can be biologically oxidized, the resulting products being sulfates or elemental sulfur. The demand for oxygen is about 2 to 1.

(b) Naturally Occurring: Ammonia and sulfide are both ubiquitous in the aquatic environment because of their involvement in the natural nitrogen and sulfur cycles respectively. Consequently, both moieties include elements essential for specific life functions.

(c) Biodegradable: The criterion refers to the rate at which a living organism will reduce an original chemical concentration or alter the original chemical into another substance with different characteristics. Because ammonia and sufide are necessary for certain forms of life, they are assimilated as nutrients reducing their concentrations or changing their original chemical forms.

(d) A Traditional and Primary Focus of Wastewater Control: This criterion refers to those pollutants intended to be removed by conventional primary and secondary treatment. This conclusion is based on the definition of the BCT test (44 FR 50733, August 29, 1979), which indicates that conventional pollutants are those removed by primary and secondary treatment at Publicly Owned Treatment Works (POTW). Neither ammonia nor sulfide have traditionally been the primary focus of this conventional treatment technology. With respect to ammonia, nitrogen removal technologies exist, but are recognized by the Agency as wastewater treatment beyond conventional (see Process Design Manual for Nitrogen Control U.S. EPA Technology Transfer Document, October 1975, p. 2–21). Ammonia therefore is outside the ambit of traditional wastewater control.

Sulfide likewise is not intentionally removed by conventional wastewater treatment. Sulfide removal technologies do exist for specific industries but are not a primary focus in the design of municipal wastewater treatment plants (i.e., POTW's) (see Development Document for Effluent Guidelines and New Source Performance Standards for the Petroleum Refining Point Source Category, April 1974, U.S. EPA, p. 143). Sulfide thus does not meet the criterion of being traditionally the primary focus of wastewater treatment.

It should be noted that conventional primary and secondary treatment can result in some *incidental* removal of either ammonia or sulfide. Incidental pollutant removal is not, however, equivalent to intended removal. Obviously, only intended removal can be the primary focus in treatment technology.

The Agency therefore determines that neither ammonia nor sulfide is a primary focus of traditional wastewater treatment, and consequently denies the listing petition. This action is factually consistent with our earlier actions in determining whether to list substances under section 304(a)(4). Thus, oil and grease, listed as conventional pollutants in 44 FR 44501 (July 30, 1979), are intentionally removed in conventional wastewater treatment facilities. Phosphorus, which the Agency decided against listing as a conventional pollutant in the same rulemaking, "is not commonly treated by POTW's employing secondary treatment * * *" and as such has not traditionally been a primary focus of wastewater control (*id.*).

In the rulemaking for phosphorus, the Agency stated that whether a substance is commonly treated by secondary treatment is not relevant in designating conventional pollutants (44 FR at 44502). This was an erroneous statement. What was in fact intended was that for phosphorus, this criterion was not of primary concern. Instead, the Agency placed greater importance on phosphorus being an environmental problem only in limited geographical areas (*id.*). Non-conventional status therefore was desirable to retain regulatory flexibility (i.e., sections 301(c) and 301(g) waivers from BAT when justified), which flexibility would be unavailable if phosphorus were listed as a conventional pollutant.

Although not necessary to the disposition of this petition, in EPA's judgment the retention of ammonia and sulfide as non-conventional pollutants may be less impactive than listing them as conventional pollutants under section 304(a)(4). Conventional pollutants are subject without exception to Best Conventional Pollutant Control Technology (BCT). Non-conventional pollutants are subject to Best Available Technology Economically Achievable (BAT) but may be eligible for economic or water-quality based waivers under sections 301(c) and 301(g), respectively. Although relative costs have not yet been quantified, it may be that BAT waivers (if granted) would prove less costly than (mandatory) imposition of BCT.[1]

Conclusion

Since ammonia and sulfide do not meet the criteria for listing as conventional pollutants, the petition is denied.

Date: November 24, 1980.

Douglas M. Costle,
Administrator.

Appendix

Summary of Public Comments

1. EPA water quality based effluent requirements will adequately protect aquatic life from potential ammonia toxicity.

2. Sulfide is not naturally occurring in the sense of normally being present at background levels in receiving streams. It is not biodegradable like the organic constituents of municipal and industrial wastewaters, and it can exert considerable chemical oxygen demand. Furthermore, it has not traditionally been within the primary focus of wastewater control.

3. Advanced treatment for ammonia removal is notorious for high costs and expenses, low reliability and seasonal variation. Also, because the cost and extent of removal vary so greatly depending on the treatment, no reasonably meaningful comparison of costs and levels of ammonia removal in POTW's and costs and removal efficiencies via BCT is possible.

4. Ammonia is naturally occurring, biodegradable, oxygen demanding material, and a pollutant that has traditionally been the primary focus of wastewater control. Support for these statements can be found in a number of EPA and scientific documents; i.e., ammonia effluent limits appear in many guidelines for industrial point source categories, and ammonia treatment technology is detailed in the EPA Technology Transfer document "Process Design Manual for Nitrogen Control."

5. EPA should analyze the economic consequences of adding sulfide to the conventional pollutants list on other industries not affiliated with the American Iron and Steel Institute.

6. By placing ammonia and sulfide on the conventional pollutants list, the Agency's authority to make modifications in effluent limits for either chemical would be eliminated. The availability of BATEA modifications is preferred to the loss of these modifications as a result of ammonia and sulfide being conventional pollutants.

7. EPA should add ionized ammonia to the conventional pollutants list.

8. Since ammonia is toxic only in the high concentrations which are usually associated with spills and runoff, control should be site-specific.

9. Since EPA failed to demonstrate an ammonia-induced toxicity problem resulting from industrial discharge in U.S. waters, ammonia should remain a non-conventional pollutant and be regulated on a case-by-case basis by way of BATEA waivers.

10. Since EPA decided not to add phosphorus to the conventional pollutants list because of its impact on a limited number of streams (see 44 FR 44501; July 30, 1979), ammonia should on the same basis, remain a non-conventional pollutant.

11. EPA should make available the information it will consider on a case-by-case determination of BCT for removal of ammonia in lieu of the tests under Section 304(b)(4)(B). No lesser standards for review of BCT are appropriate than those employed for POTW's (i.e., a showing of: significant water quality improvement, mitigation of public health problems, financial impact on owner/operator of treatment facility, and the inflationary costs for interim delays).

12. EPA should develop a similar notice for adding ammonia and sulfide to the conventional pollutants list as it did for adding ammonia to the toxic pollutants list. As presented in the notice for ammonia and sulfide, there is no technical information from which a thorough understanding of the problem can be established. Additionally, because of the lack of established BCT and BATEA effluent limits, no comment can be appropriately formulated.

[1] Additional discussion of this issue appears in the Agency's notice withdrawing its proposal to list ammonia as a toxic pollutant under section 307(a) (45 FR 803).

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